Remote Sensing of Environment

An Interdisciplinary Journal

VOLUME 58, NUMBER 1, OCTOBER 1996

Contents

Michael Roderick, Richard Smith, and Graham Lodwick
Calibrating Long-Term AVHRR-Derived NDVI Imagery 1

S. M. Bhandari and A. K. Varma
Potential of Simultaneous Dual-Frequency Radar Altimeter Measurements from TOPEX / Poseidon for Rainfall Estimation over Oceans 13

Nan D. Walker
Satellite Assessment of Mississippi River Plume Variability: Causes and Predictability 21

Josef Cihlar, Hung Ly, and Qinghan Xiao
Land Cover Classification with AVHRR Multichannel Composites in Northern Environments 36

Karl-Theodor Kriebel
On the Limited Validity of Reciprocity in Measured BRDFs 52

Bruce Hapke, Dominick DiMucci, Robert Nelson, and William Smythe
The Cause of the Hot Spot in Vegetation Canopies and Soils: Shadow-Hiding Versus Coherent Backscatter 63

Giovanni M. Ferrari, Nicolas Hoepffner, and Marina Mingazzini
Optical Properties of the Water in a Deltaic Environment: Prospective Tool to Analyze Satellite Data in Turbid Waters 69

Manuel A. Penaloza and Ronald M. Welch
Feature Selection for Classification of Polar Regions Using a Fuzzy Expert System 81

Hélène Cosnefroy, Marc Leroy, and Xavier Briottet
Selection and Characterization of Saharan and Arabian Desert Sites for the Calibration of Optical Satellite Sensors 101

F. Veroustraete, J. Patyn, and R. B. Myneni
Estimating Net Ecosystem Exchange of Carbon Using the Normalized Difference Vegetation Index and an Ecosystem Model 115

VOLUME 58, NUMBER 2, NOVEMBER 1996

Contents

J. P. Gastellu-Etchegorry, V. Demarez, V. Pinel, and F. Zagolski
Modeling Radiative Transfer in Heterogeneous 3-D Vegetation Canopies 131

L. Camenen, Y. Goulas, G. Guyot, Z. G. Cerovic, G. Schmuck, and I. Moya
Estimation of the Chlorophyll Fluorescence Lifetime of Plant Canopies: Validation of a Deconvolution Method Based on the Use of a 3-D Canopy Mockup 157

Stephen V. Stehman
Use of Auxiliary Data to Improve the Precision of Estimators of Thematic Map Accuracy 169

A. Chehbouni, D. Lo Seen, E. G. Njoku, and B. M. Monteny
Examination of the Difference between Radiative and Aerodynamic Surface Temperatures over Sparsely Vegetated Surfaces 177

J. L. Privette, W. J. Emery, and D. S. Schimel
Inversion of a Vegetation Reflectance Model with NOAA AVHRR Data 187

Michel M. Verstraete, Bernard Pinty, and Ranga B. Myneni
Potential and Limitations of Information Extraction on the Terrestrial Biosphere from Satellite Remote Sensing 201

Ricardo M. Letelier and Mark R. Abbott
An Analysis of Chlorophyll Fluorescence Algorithms for the Moderate Resolution Imaging Spectrometer (MODIS) 215

VOLUME 58, NUMBER 3, DECEMBER 1996

Contents

Aaron Moody and Curtis E. Woodcock
Calibration-Based Models for Correction of Area Estimates Derived from Coarse Resolution Land-Cover Data 225

X. Zhan, W. P. Kustas, and K. S. Humes
An Intercomparison Study on Models of Sensible Heat Flux over Partial Canopy Surfaces with Remotely Sensed Surface Temperature 242

Bo-Cai Gao
NDWI—A Normalized Difference Water Index for Remote Sensing of Vegetation Liquid Water From Space 257

Yuji Hirosawa, Stuart E. Marsh, and Douglas H. Kliman
Application of Standardized Principal Component Analysis to Land-Cover Characterization Using Multitemporal AVHRR Data 267

Marco Mariotti, Laura Ercoli, and Alessandro Masoni
Spectral Properties of Iron-Deficient Corn and Sunflower Leaves 282

Anatoly A. Gitelson, Yoram J. Kaufman, and Mark N. Merzlyak
Use of a Green Channel in Remote Sensing of Global Vegetation from EOS-MODIS 289

Yunyue Yu and William J. Emery
Satellite Derived Sea Surface Temperature Variability in the Western Tropical Pacific Ocean, 1992–1993 299

Z. G. Cerovic, Y. Goulas, M. Gorbunov, J.-M. Briantais, L. Camenen, and I. Moya
Fluorosensing of Water Stress in Plants: Diurnal Changes of the Mean Lifetime and Yield of Chlorophyll Fluorescence, Measured Simultaneously and at Distance With a τ-LIDAR and a Modified PAM-Fluorimeter, in Maize, Sugar Beet, and Kalanchoë 311

Brigitte Leblon, Lisa Gallant, and Hardy Granberg
Effects of Shadowing Types on Ground-Measured Visible and Near-Infrared Shadow Reflectances 322

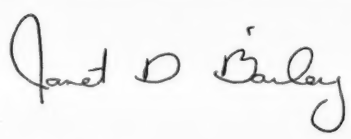
Aaron Moody, Sucharita Gopal, and Alan H. Strahler
Artificial Neural Network Response to Mixed Pixels in Coarse-Resolution Satellite Data 329

Author Index 344

Subject Index 349

Volume Contents

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION (Required by 39 U.S.C. 3685). 1. Publication title: Remote Sensing of Environment. 2. Publication number: 989-320. 3. Filing date: 10/01/96. 4. Issue frequency: Monthly. 5. Number of issues published annually: 12. 6. Annual subscription price: $1236. 7. Complete mailing address of known office of publication: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107. 8. Complete mailing address of headquarters or general business office of publisher: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107. 9. Full names and complete mailing addresses of publisher, editor, and managing editor: publisher, Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107; editor, Marvin E. Bauer, Remote Sensing Laboratory, University of Minnesota, 1530 North Cleveland Ave., St. Paul, MN 55108; managing editor, Keith Kreisher, Elsevier Science Inc., 655 Avenue of the Americas, NY, NY 10010-5107. 10. Owner: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107, a wholly-owned subsidiary of Reed/Elsevier US Holdings, 4520 East West Highway, Bethesda, MD 20814. 11. Known bondholders, mortgagees, and other security holders owning or holding one percent or more of total amount of bonds, mortgages, or other securities: none. 12. Not applicable. 13. Publication name: Remote Sensing of Environment. 14. Issue date for circulation data below: Vol. 58, No. 1, August 1996. 15. Extent and nature of circulation. 15a. Total number of copies: average number of copies each issue during preceding 12 months, 1,231; actual number of copies of single issue published nearest to filing date, 1,100. 15b. Paid and/or requested circulation. (1) Sales through dealers and carriers, street vendors, and counter sales: average number of copies each issue during preceeding 12 months, 0; actual number of copies of single issue published nearest to filing date, 0. (2) Paid or requested maii subscriptions: average number of copies each issue during preceding 12 months, 832; actual number of copies of single issue published nearest to filing date, 795. 15c. Total paid and/or requested circulation: average number of copies each issue during preceding 12 months, 832; actual number of copies of single issue published nearest to filing date, 795. 15d. Free distribution by mail: average number of copies each issue during preceding 12 months, 50; actual number of copies of single issue published nearest to filing date, 49. 15e. Free distribution outside the mail: average number of copies each issue during preceding 12 months, 0; actual number of copies of single issue published nearest to filing date, 0. 15f. Total free distribution: average number of copies each issue during preceding 12 months, 50; actual number of copies of single issue published nearest to filing date, 49. 15g. Total distribution: average number of copies each issue during preceding 12 months, 882; actual number of copies of single issue published nearest to filing date, 844. 15h. Copies not distributed. (1) Office use, leftovers, spoiled: average number of copies each issue during preceding 12 months, 349; actual number of copies of single issue published nearest to filing date, 256. (2) Return from news agents: average number of copies each issue during preceding 12 months, 0; actual number of copies of single issue published nearest to filing date, 0. 15i. Total: average number of copies each issue during preceding 12 months, 1,231; actual number of copies of single issue published nearest to filing date, 1,100. Percent paid and/or requested circulation: average number of copies each issue during preceding 12 months, 94.33%; actual number of copies of single issue published nearest to filing date, 94.19%. 16. This Statement of Ownership will be printed in the Vol. 58, No. 3, December 1996 issue of this publication. 17. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (*including fines and imprisonment*) and/or civil sanctions (*including multiple damages and civil penalties*).



Janet D. Bailey
Director of Marketing